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AMENDMENT UNDER 37 C.F.R. § 1.312

Serial Number: 10/081,439

Filing Date: February 20, 2002

Title: EVAPORATED LAALO3 FILMS FOR GATE DIELECTRICS

In the Claims

(Original) A method of forming a gate dielectric on a transistor body region, comprising: evaporating Al₂O₃ at a first rate;
evaporating La₂O₃ at a second rate; and controlling the first rate and the second rate to provide a film containing LaAlO₃ on the transistor body region.

- 2. (Original) The method of claim 1, wherein evaporating Al₂O₃ and evaporating La₂O₃ includes evaporating dry pellets of Al₂O₃ and La₂O₃.
- 3. (Original) The method of claim 1, wherein evaporating La₂O₃ includes evaporating La₂O₃ by electron beam evaporation.
- 4. (Original) The method of claim 1, wherein controlling the first rate and the second rate includes controlling the first rate and the second rate to selectively provide a film composition having a predetermined dielectric constant.
- 5. (Original) The method of claim 4, wherein selectively providing a film composition having a predetermined dielectric constant includes providing a film composition with a dielectric constant ranging from the dielectric constant of an Al₂O₃ film to the dielectric constant of a La₂O₃ film.
- 6. (Original) The method of claim 1, wherein controlling the first rate and the second rate to provide a film containing LaAlO₃ includes providing an amorphous LaAlO₃ film.
- 7. (Original) The method of claim 1, wherein evaporating La₂O₃ begins substantially concurrent with beginning evaporating Al₂O₃.

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8. (Original) The method of claim 1, wherein evaporating Al_2O_3 and evaporating La_2O_3 includes depositing $LaAlO_3$ on the transistor body region in a base pressure lower than about 5×10^{-7} Torr and in a deposition pressure lower than about 2×10^{-6} Torr.

- 9. (Original) The method of claim 1, further including annealing the transistor body region after providing the film containing LaAlO₃.
- 10. (Original) The method of claim 9, wherein annealing the transistor body region after providing the film containing LaAlO₃ includes annealing in N₂.
- 11. (Original) The method of claim 10, wherein annealing in N₂ includes annealing in an electric furnace at about 700°C.
- 12. (Original) The method of claim 10, wherein annealing in N₂ includes annealing in RTA in the range from about 800°C to about 900°C.
- 13. (Original) A method of forming a gate dielectric on a transistor body region, comprising: evaporating Al₂O₃ at a first rate using a first electron gun; evaporating La₂O₃ at a second rate using a second electron gun; and controlling the first rate and the second rate to provide a film containing LaAlO₃ on the transistor body region.
- 14. (Original) The method of claim 13, wherein evaporating Al₂O₃ and evaporating La₂O₃ includes evaporating dry pellets of Al₂O₃ and La₂O₃.
- 15. (Original) The method of claim 13, wherein controlling the first rate and the second rate includes controlling the first rate and the second rate to selectively provide a film composition having a predetermined dielectric constant.

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(Original) The method of claim 15, wherein selectively providing a film composition 16. having a predetermined dielectric constant includes providing a film composition with a dielectric constant ranging from the dielectric constant of an Al₂O₃ film to the dielectric constant of a La₂O₃ film.

- 17. (Original) The method of claim 13, wherein controlling the first rate and the second rate to provide a film containing LaAlO₃ includes providing an amorphous LaAlO₃ film.
- 18. (Original) The method of claim 13, wherein evaporating La₂O₃ begins substantially concurrent with beginning evaporating Al₂O₃.
- 19. (Original) The method of claim 13, wherein forming the gate dielectric includes growing the film containing LaAlO₃ at a growth rate in the range from about 0.5 nm/min to about 50 nm/min.
- 20. (Original) The method of claim 13, further including annealing the transistor body region after providing the film containing LaAlO₃.
- 21. (Original) A method of forming a gate dielectric on a transistor body region, comprising: evaporating Al₂O₃ at a first rate using a first electron gun; evaporating La₂O₃ at a second rate using a second electron gun; controlling the first rate and the second rate to provide a film containing LaAlO₃ on the transistor body region; and

annealing in N₂ after providing the film containing LaAlO₃ on the transistor body region.

22. (Original) The method of claim 21, wherein evaporating Al₂O₃ and evaporating La₂O₃ includes evaporating dry pellets of Al₂O₃ and La₂O₃.

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23. (Original) The method of claim 21, wherein controlling the first rate and the second rate includes controlling the first rate and the second rate to selectively provide a film composition having a predetermined dielectric constant.

- 24. (Original) The method of claim 21, wherein controlling the first rate and the second rate to provide a film containing LaAlO₃ includes providing an amorphous LaAlO₃ film.
- 25. (Original) The method of claim 21, wherein evaporating La₂O₃ begins substantially concurrent with beginning evaporating Al₂O₃.
- 26. (Original) The method of claim 21, wherein evaporating Al₂O₃ and evaporating La₂O₃ includes depositing LaAlO₃ on the transistor body region in a base pressure lower than about 5x10⁻⁷ Torr and in a deposition pressure lower than about 2x10⁻⁶ Torr.
- 27. (Original) The method of claim 21, wherein annealing in N₂ includes annealing in an electric furnace at about 700°C.
- 28. (Original) The method of claim 21, wherein forming the gate dielectric includes growing the film containing LaAlO₃ at a growth rate in the range from about 0.5 nm/min to about 50 nm/min.
- 29. (Original) A method of forming a transistor, comprising:

forming first and second source/drain regions;

forming a body region between the first and second source/drain regions;

evaporating Al₂O₃ at a first rate;

evaporating La2O3 at a second rate;

controlling the first rate and the second rate to provide a film containing LaAlO₃ on the body region; and

coupling a gate to the film containing LaAlO₃.

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30. (Original) The method of claim 29, wherein evaporating Al₂O₃ and evaporating La₂O₃ includes evaporating dry pellets of Al₂O₃ and La₂O₃.

- 31. (Original) The method of claim 29, wherein controlling the first rate and the second rate includes controlling the first rate and the second rate to selectively provide a film composition having a predetermined dielectric constant.
- 32. (Original) The method of claim 29, wherein selectively providing a film composition having a predetermined dielectric constant includes providing a film composition with a dielectric constant ranging from the dielectric constant of an Al₂O₃ film to the dielectric constant of a La₂O₃ film.
- 33. (Original) The method of claim 29, wherein controlling the first rate and the second rate to provide a film containing LaAlO₃ includes providing an amorphous LaAlO₃ film.
- 34. (Original) The method of claim 29, wherein evaporating La₂O₃ begins substantially concurrent with beginning evaporating Al₂O₃.
- 35. (Currently Amended) A method of forming a memory array, comprising: forming a number of access transistors, comprising:

forming first and second source/drain regions;

forming a body region between the first and second source/drain regions;

evaporating Al₂O₃ at a first rate;

evaporating La₂O₃ at a second rate;

controlling the first rate and the second rate to provide a film containing LaAlO₃ on the body region[[.]]; and

coupling a gate to the film containing LaAlO₃:

forming a number of wordlines coupled to a number of the gates of the number of access transistors;

forming a number of sourcelines coupled to a number of the first source/drain regions of the number of access transistors; and

forming a number of bitlines coupled to a number of the second source/drain regions of the number of access transistors.

- 36. (Original) The method of claim 35, wherein evaporating Al₂O₃ and evaporating La₂O₃ includes evaporating dry pellets of Al₂O₃ and La₂O₃.
- 37. (Original) The method of claim 35, wherein controlling the first rate and the second rate includes controlling the first rate and the second rate to selectively provide a film composition having a predetermined dielectric constant.
- 38. (Original) The method of claim 37, wherein selectively providing a film composition having a predetermined dielectric constant includes providing a film composition with a dielectric constant ranging from the dielectric constant of an Al₂O₃ film to the dielectric constant of a La₂O₃ film.
- 39. (Original) The method of claim 35, wherein forming the gate dielectric includes growing the film containing LaAlO₃ at a growth rate in the range from about 0.5 nm/min to about 50 nm/min.
- 40. (Currently Amended) A method of forming an information handling system, comprising: forming a processor;

forming a memory array, comprising:

forming a number of access transistors, comprising:

forming first and second source/drain regions;

forming a body region between the first and second source/drain regions;

evaporating Al₂O₃ at a first rate;

evaporating La₂O₃ at a second rate;

controlling the first rate and the second rate to provide a film containing LaAlO₃ on the body region[[.]]; and

coupling a gate to the film containing LaAlO₃;

forming a number of wordlines coupled to a number of the gates of the number of access transistors;

forming a number of sourcelines coupled to a number of the first source/drain regions of the number of access transistors;

forming a number of bitlines coupled to a number of the second source/drain regions of the number of access transistors; and

forming a system bus that couples the processor to the memory array.

- 41. (Original) The method of claim 40, wherein evaporating Al₂O₃ and evaporating La₂O₃ includes evaporating dry pellets of Al₂O₃ and La₂O₃.
- 42. (Original) The method of claim 40, wherein evaporating La₂O₃ and evaporating Al₂O₃ includes evaporating La₂O₃ and evaporating Al₂O₃ by electron beam evaporation.
- (Original) The method of claim 40, wherein controlling the first rate and the second rate 43. includes controlling the first rate and the second rate to selectively provide a film composition having a predetermined dielectric constant.

44-67. (Canceled)